REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

Recently noted minor typographical errors in the specification have been corrected above.

The rejection of claims 1-15 under 35 U.S.C. §103 as allegedly being "anticipated" by Friedman in view of Liu is respectfully traversed.

It is assumed that the Examiner intended to assert "obviousness" under 35 U.S.C. §103.

The Examiner now admits that Friedman does not teach computing a new probability parameter (to be included in a new repetition of requests) by forecasting (from received counts and underlying probability parameters) an upper bound for the number of receivers – and repeating the process iteratively to provide successive outputs more accurately tracking the then current size of a multicast audience.

To supply this admitted deficiency of Friedman, the Examiner now relies upon Liu. However, in reality, the Liu teaching is limited to the "NB" technique that is fundamentally incompatible with the "BTW" technique utilized by Friedman. Furthermore, as will be explained in more detail below, even if these two disparate references are somehow "combined" *arguendo*, one would still not discover the applicants' claimed

invention. Indeed, both Friedman and Liu teach away from the applicants' claimed invention.

The Examiner alleges to have found reference in Friedman to "counting the number of replies." However, the section referred to (page 972, column 1, paragraph 5, lines 2-6) is not part of the main work (which is directed to the two polling methods: BTW and NB), but is a section dedicated to "related work." The text quoted refers to RTP (i.e., to neither BTW nor NB) and relates to direct counting of receivers, not responses.

In more detail, Friedman defines RTP as follows:

> "6.2.2 Maintaining the number of session members
>
> Calculation of the RTCP packet interval depends upon an estimate of the number of sites participating in the session. New sites are added to the count when they are heard, and an entry for each is created in a table indexed by the SSRC or CSRC identifier (see Section 8.2) to keep track of them. New entries may not be considered valid until multiple packets carrying the new SSRC have been received (see Appendix A.1)." [Emphasis added.]

Friedman does not teach counting responses as required by the audience size tracing method of applicants' claim 1. According to Friedman, BTW operates by detecting only the first response from a particular receiver, not counting responses (from whatever receiver sends feedback). According to Friedman, NB operates by obtaining feedback in a single polling round in which only the receiver with the lowest timer

parameter responds (see page 965, column 2, paragraph 1). The additional feature of counting responses, lacking from Friedman, is also not taught by Liu.

The present invention includes the technique, not previously described in the art of, from the value of a probabilistic polling parameter selected for polling and from the count of responses received as a result of a poll, forecasting an upper bound for the number of receivers and determining therefrom a new value for the parameter for use in a subsequent poll. Friedman does not seek to forecast a value for this upper bound, but assumes that this upper bound, referred to in Friedman as n_{max}, is known (see III.D, first paragraph on page 968, column 1 and III.E, first paragraph on page 968, column 2). The solution proposed by Friedman leads the skilled reader away from the invention as Friedman provides no indication of a need to discover (e.g., intelligently change an estimate of) an upper bound on the number of receivers.

The present invention brings an advantage over the prior art of Friedman of the ability to cope with a situation in which the number of receivers is changing during the course of a multicast transmission. The present invention provides improved performance in multicast operations where audience size is varying significantly in the course of the multicast.

The teaching of Friedman that the Examiner seeks to combine with Liu: "whereby each terminal replies or not with a corresponding probability" relates to the BTW technique, but this is incompatible with the teaching of Liu which is based on the

NB technique. Applicants' representative is not aware of any known fusion of BTW with NB. BTW requires a probabilistic polling parameter, whereas NB requires timer parameters. Assuming that the Examiner intended to refer to the NB technique described in Friedman, this is restricted to the case of NB obtaining feedback in a single polling round and is aimed at static audiences.

The NB technique described by Liu differs from the invention of applicants' claim 1 in requiring a timer embedded at each receiver. The sender issues a timer parameter (not a probabilistic polling parameter) to each receiver. The timer parameter determines the period at which the receiver issues a response to the RFB. Upon receiving the RFB, each receiver samples a back-off time from the timer parameter. After expiry of this back-off time, the receiver remains silent if it has detected a feedback message from any other receiver; otherwise, it sends a response to the sender. Significantly, NB requires any response to be multicast to each receiver, in addition to responding to the sender.

The need for each response to be multicast to each receiver, in addition to responding to the sender, introduces an undesirable increase in overhead, which is not required when using the present invention. The NB technique also requires several rounds of feedback collection from the same audience in order to accurately estimate audience size: adding further to overhead and rendering the estimate inaccurate when

the audience size changes during a collection round. These are significant disadvantages when trying to track the size of a fast-changing audience.

The present invention, as set out in claim 1, provides a quick and efficient way of forecasting an upper bound for the number of receivers and, from the forecast value, determines an appropriate value for a probabilistic polling parameter. This is a radically different approach to Friedman according to which the upper bound for the number of receivers is given. With the upper bound being a given, no motivation can be found in Friedman to alter the given BTW technique for estimation of the maximum audience size. Liu teaches the known NB technique which is fundamentally different in not using the probabilistic polling parameter of the invention, resulting in a less efficient and less effective technique for determining an upper bound to the audience size.

As demonstrated above, the present invention is not found in or suggested by Friedman or Liu – both of which teach away from the present invention. The present invention provides an efficient and accurate method for audience estimation, including fast-changing audiences, while minimizing overhead. The invention alleviates the problems of the prior art by using an adaptive method for sampling feedback from receivers. The adaptive method minimizes the risk of feedback implosion and at the same time helps to ensure that the sender receives the maximum possible number of feedback messages.

Given such fundamental deficiencies of both references as already discussed with respect to certain features of independent claims 1 and 13-15, it is not necessary at this time to discuss in detail further deficiencies of this allegedly "obvious" combination of references with respect to other aspects of the rejected claims. Suffice it to note that, as a matter of law, it is impossible to supply even a *prima facie* case of "obviousness" unless the cited references teach or suggest each and every feature of the rejected claim.

Accordingly, this entire application is now believed to be in allowable condition, and a formal notice to that effect is earnestly solicited.

Respectfully submitted,

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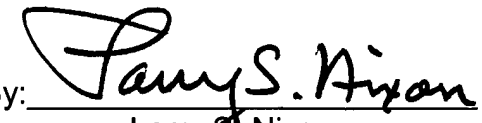
By: 
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